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Bed Sediment Photography and Analysis

Effect of Urbanization on

Stream Bed Sediments in Anchorage

by: **Dennis Estis**

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Background

- **Wolman pebble counts- labor intensive, limited by depth of water**

- **McNeil- does not work in sediments much larger than 2mm (sand)**

- **Freeze core- takes time, involves heavy, cumbersome equipment, expensive**

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Objectives

- **Find streambed sediment analysis method that allows ease of collection and yields quantitative results**

- **Develop photographic method for stream bed sediment analysis**

- **Determine effectiveness of photographic method by relating to Wolman counts and percent embeddedness.**

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Methods

- **Photograph bed sediments at 3 points along each of the 11 transects per site**
- **Record point velocity and depth measurements at each point**
- **Determine scale in each photo, digitize surface pebbles, and areas of sand (less than 2mm)**
- **Measure intermediate axis lengths of surface pebbles**
- **Determine percent area of sand and particle size frequency distribution**

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Equipment

- **35mm SLR camera**

- **28-70mm zoom lens**

- **Misc. filters- circular polarizer, neutral density, U.V. protector**

- **12"diameter sample ring with scale bar**

- **Partially submergible bed sediment viewer with camera attachment**

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Equipment

Sediment Size Breaks

- **Sand (>0.063-2 mm)**
- **Fine/ medium gravel (>2-16 mm)**
- **Coarse gravel (>16-32 mm)**
- **Very coarse gravel (>32-64 mm)**
- **Small cobble (>64-128 mm)**
- **Large cobble (>128-256 mm)**
- **Small boulder (>256-512 mm)**
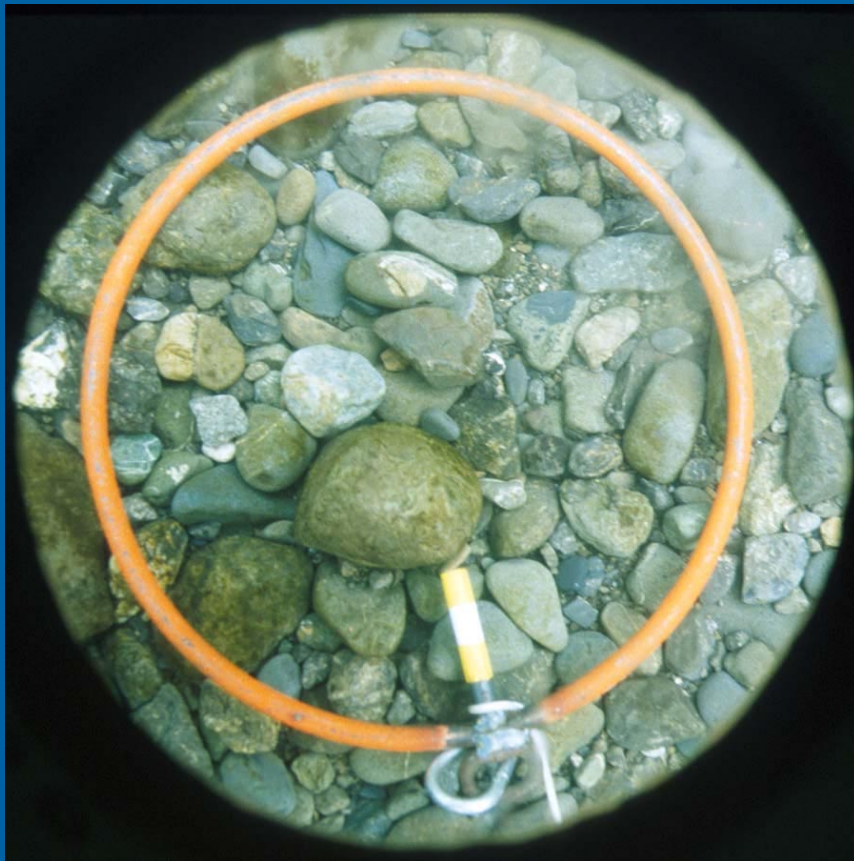- **Large boulder, irregular bedrock, irregular hardpan, irregular artificial surface (>512 mm)**

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Sample Photos

- **100 percent embedded (sand or finer- < 2mm)**

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Sample Photos

- **Fine / medium gravel (>2-16 mm)**

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Sample Photos
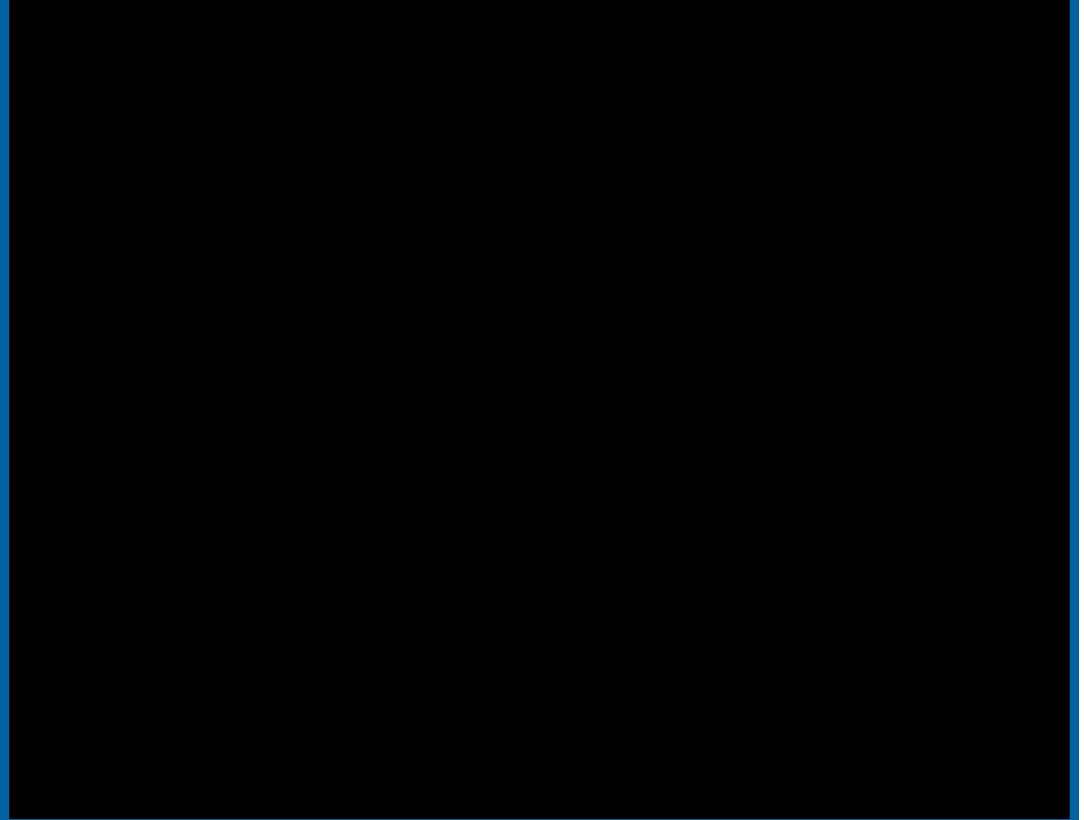

- **Coarse – very coarse gravel (>16-32 mm, >32-64 mm)**

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Sample Photos

- **Small – large cobble (>64-128 mm, >128-256 mm)**
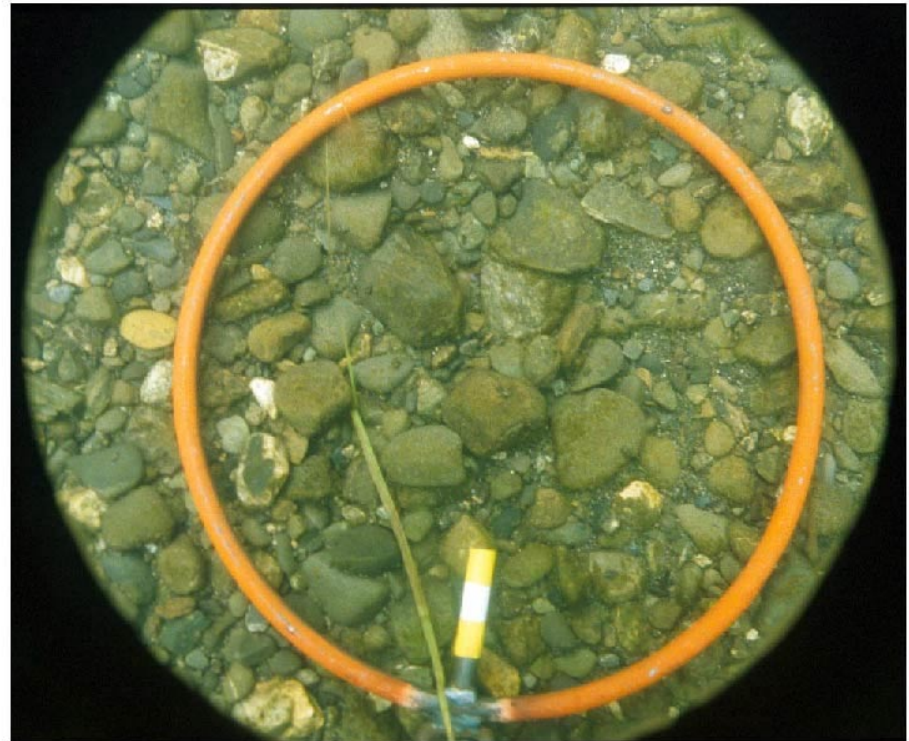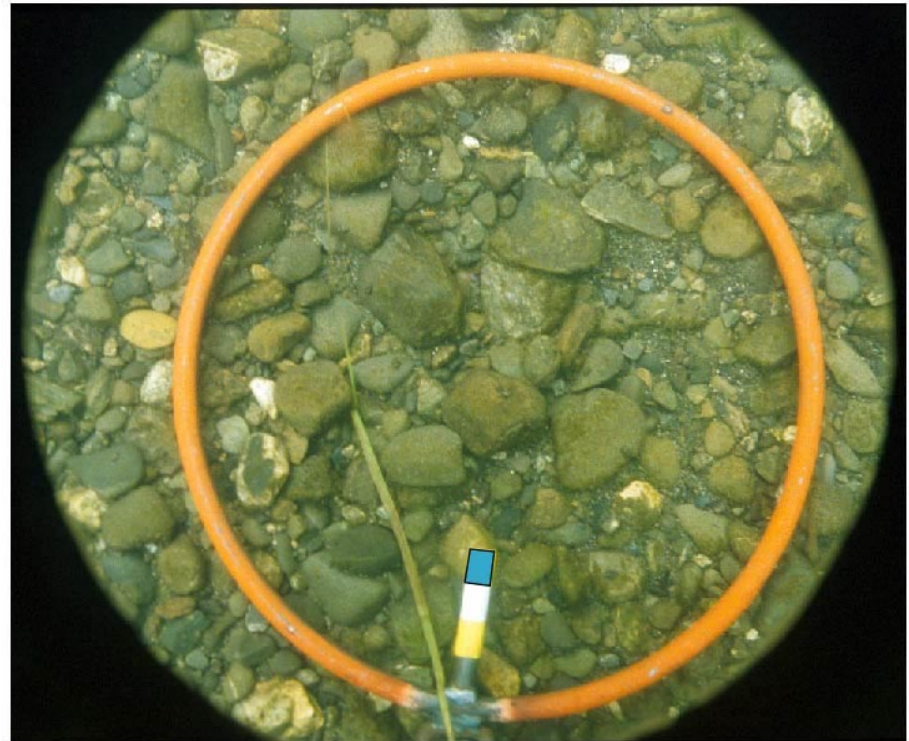
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Sediment Photography Analysis

- Determine scale

- Digitize areas of sand

- Digitize surface pebbles larger than 2mm

- Measure intermediate axis lengths (not shown)

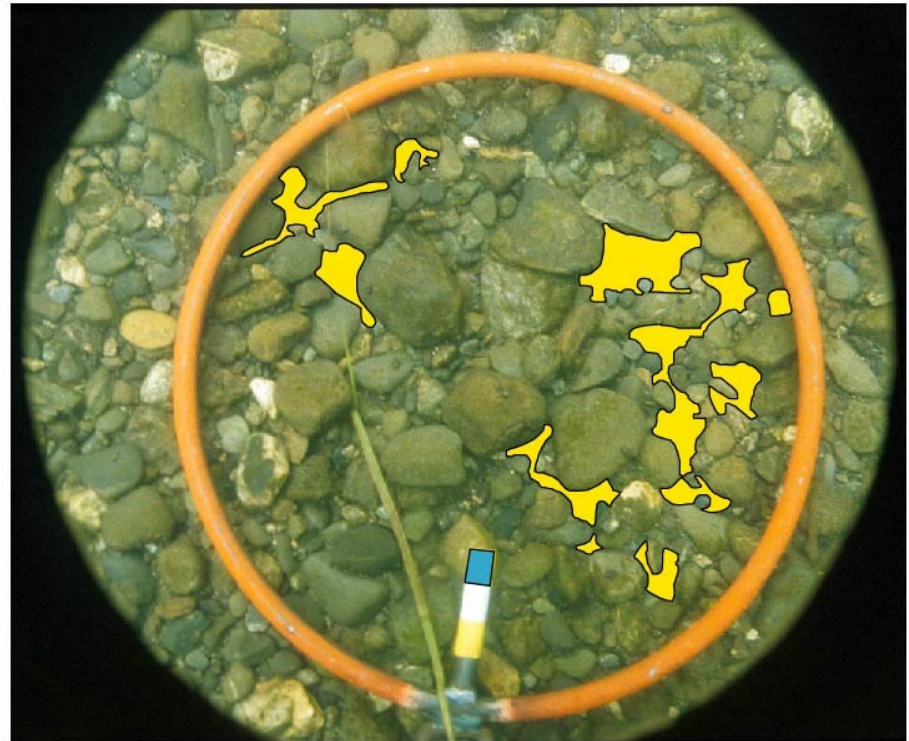**≋USGS**

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